

## Summer Review

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**Simplify.**

1)  $-3\sqrt[4]{648x^6}$

2)  $-4\sqrt[3]{128x^9}$

3)  $-10\sqrt[4]{80b}$

4)  $(-4\sqrt{5} + 2\sqrt{3})(5\sqrt{3} + 2\sqrt{3})$

5)  $(\sqrt{2} + \sqrt{5})^2$

6)  $\frac{\sqrt{3}}{-1 - \sqrt{2}}$

7)  $\frac{3}{2\sqrt{5} - 3\sqrt{3}}$

8)  $\frac{\sqrt{3}}{2\sqrt{2} + 2}$

9)  $(64p^6)^{-\frac{1}{2}}$

10)  $(81x^6)^{\frac{3}{2}}$

11)  $(64n^2)^{-\frac{1}{2}}$

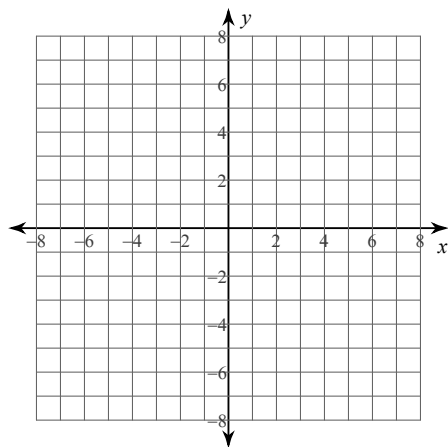
**Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.**

$$12) \frac{xyx^2}{\left(-\frac{7}{4}\right)^{-\frac{1}{2}}}$$

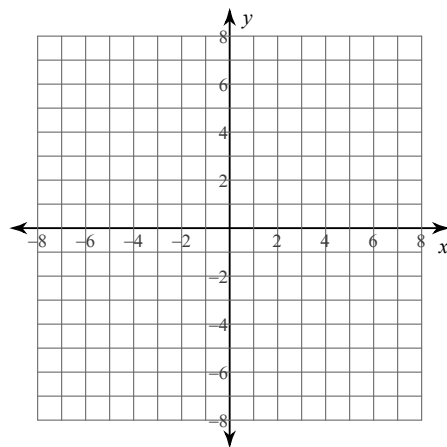
$$13) \frac{y^{\frac{3}{4}}}{(y^{-2})^{-\frac{4}{3}} \cdot x^{-\frac{4}{3}} y^{-1}}$$

**Identify the domain and range of each. Then sketch the graph.**

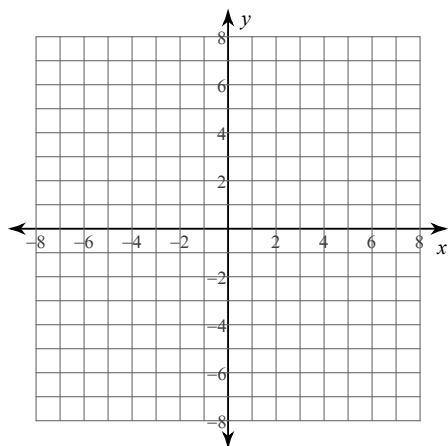
$$14) y = \sqrt{x-3}$$



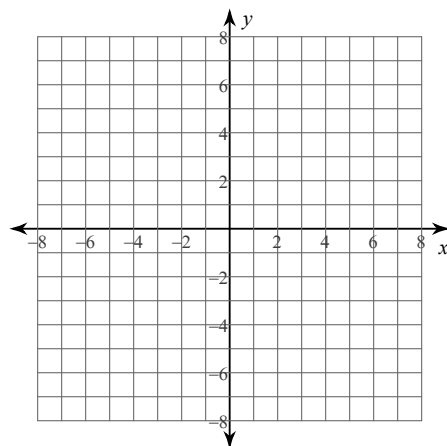
$$15) y = \sqrt{x}$$



$$16) y = \frac{2}{3}\sqrt{x-2} + 5$$



$$17) y = \frac{1}{2}\sqrt{x+6}$$



**Solve each equation.**

$$18) \frac{19}{5} \cdot \left| \frac{9}{7}r \right| = \frac{855}{49}$$

$$19) \frac{6}{13} \cdot \left| -\frac{4}{5}x \right| = \frac{16}{13}$$

$$20) \frac{6}{19} \cdot \left| -\frac{6}{5}n \right| = \frac{324}{665}$$

**Solve each inequality.**

$$21) \left| \frac{4}{23}b \right| \leq \frac{96}{115}$$

$$22) \left| v + \frac{9}{4} \right| \leq \frac{47}{12}$$

$$23) |2 + x| \geq \frac{3}{2}$$

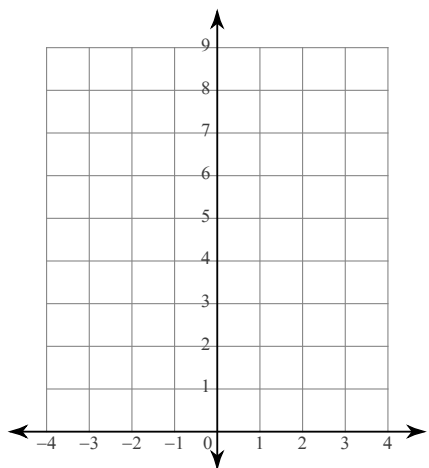
$$24) \left| -n + \frac{3}{2} \right| \leq 1$$

$$25) \left| a - \frac{29}{7} \right| \leq \frac{379}{56}$$

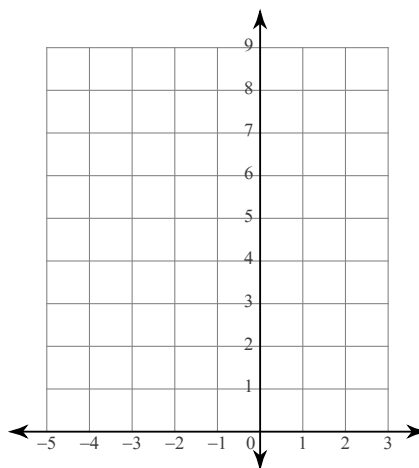
$$26) \left| k - \frac{21}{8} \right| \leq \frac{41}{8}$$

Sketch the graph of each function.

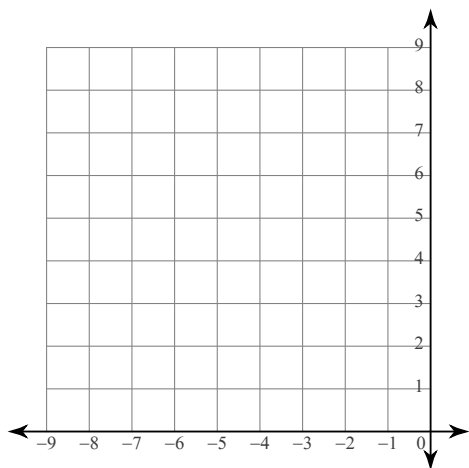
27)  $y < x^2 - 4x + 8$



28)  $y \geq x^2 + 2x + 5$



29)  $y > x^2 + 8x + 20$



**Factor each.**

30)  $y = x^6 - 64$

31)  $y = 2x^2 - 4x + 11$

32)  $y = 3x^3 - 15x^2 + 5x - 25$

33)  $y = 5x^2 - 29x + 20$

34)  $y = x^3 - 125$

35)  $y = x^3 - 64$

**Divide.**

36)  $(b^3 + 14b^2 + 54b + 39) \div (b + 5)$

37)  $(2n^3 - 14n^2 - 34n - 9) \div (n - 9)$

38)  $(v^3 - 4v^2 + 10v - 19) \div (v - 3)$

**Find each product.**

39)  $(x^2 - 7x + 6)(x + 5)$

40)  $(4x^2 + 7x - 3)(x - 4)$

**Simplify each and state the excluded values.**

41)  $\frac{k^2 + 2k - 24}{k^2 + k - 30}$

42)  $\frac{a^2 - 7a - 8}{64a^2 - 8a^3}$

43)  $\frac{14p + 42}{49p + 14}$

**Simplify each expression.**

44)  $\frac{n - 5}{2n + 2} + \frac{6n}{5n}$

45)  $\frac{5}{x - 4} + \frac{4}{x + 2}$

46)  $\frac{5}{3r} + \frac{r + 3}{3r^2 - 3r}$

47)  $\frac{3}{m - 2} + \frac{6}{m - 5}$

**Solve each equations.**

48)  $3x^2 + 8 = 260$

49)  $3n^2 - 9 = 243$

**Solve each equation.**

50)  $b^2 - 6b = -8$

51)  $p^2 + 49 = 14p$

52)  $8r^2 - 8 = -4r$

53)  $4r^2 = -4 + 8r$

**For each function, find the equations of the vertical asymptote(s) and horizontal asymptote(s) (if they exist).**

54)  $f(x) = -x^4 + x^2 + x + 3$

55)  $f(x) = -x^5 + 2x^3 - 3$

56)  $f(x) = x^4 - 4x^2 + 2x + 2$

57)  $f(x) = -x^3 + 11x^2 - 39x + 49$

**Perform the indicated operation.**

58)  $g(t) = 3t + 1$   
 $f(t) = 4t + 1$   
Find  $(g + 4f)(-1)$

59)  $g(n) = n^3 + 5$   
 $h(n) = -2n + 4$   
Find  $(g \cdot h)(-1)$

60)  $f(t) = -4t + 5$   
 $g(t) = t + 2$   
Find  $(f + g)(7)$

61)  $g(n) = 3n + 5$   
 $f(n) = 4n + 5$   
Find  $\left(\frac{g}{f}\right)(8)$

62)  $f(t) = 3t + 4$   
 $g(t) = -2t^3 + 5t$   
Find  $(f + g)(-3)$

63)  $g(x) = -2x^2 - 1$   
 $f(x) = -2x - 1$   
Find  $\left(\frac{g}{f}\right)(10)$

**Solve each equation. Remember to check for extraneous solutions.**

64)  $6 + \frac{2}{r} = \frac{1}{r}$

65)  $\frac{2n+6}{n^2} + \frac{1}{n^2} = \frac{5}{n}$

66)  $\frac{1}{6x^2} = \frac{1}{2x^2} + \frac{x+3}{2x^2}$

67)  $\frac{1}{b} = \frac{4}{b} + \frac{1}{b^2}$

$$68) \frac{1}{v} + \frac{3v+18}{v} = 1$$

$$69) \frac{1}{x} + \frac{x-5}{2x} = \frac{1}{6}$$

- 70) topics  
6-functn transformation  
8-even/odd

**Solve each equation for  $0 \leq \theta < 2\pi$ .**

$$71) -4 - 2\csc \theta = -2$$

$$72) -4 + 3\sin \theta = 2$$

$$73) -3 = -4 - \csc \theta$$

**In each problem, angle C is a right angle. Solve each triangle rounding answers to the nearest tenth.**

$$74) m\angle A = 33^\circ, b = 2 \text{ ft}$$

$$75) b = 20.5 \text{ m}, m\angle B = 52^\circ$$

$$76) c = 15 \text{ in}, b = 6 \text{ in}$$

**Use the given point on the terminal side of angle  $\theta$  to find the value of all 6 trigonometric functions.**

$$77) \sec \theta; (\sqrt{19}, -9)$$

$$78) \cos \theta; (7, -\sqrt{15})$$



**Solve each equation for  $0 \leq \theta < 360$ .**

79)  $2 - 4\cot \theta = 4\sqrt{3} + 2$

80)  $-7 + \tan \theta = -\sqrt{3} - 7$

81)  $\sqrt{3} + 2 = 2 - 3\cot \theta$

82)  $1 + 3\csc \theta = 3\sqrt{2} + 1$

**Find the exact value of each trigonometric function without a calculator.**

83)  $\sin 150^\circ$

84)  $\csc 360^\circ$

85)  $\sec 675^\circ$

**Simplify each expression.**

86) 
$$\frac{\frac{u}{2} + \frac{1}{u}}{\frac{u-5}{u^2}}$$

87) 
$$\frac{\frac{u}{2}}{\frac{2}{3} + \frac{3}{2}}$$

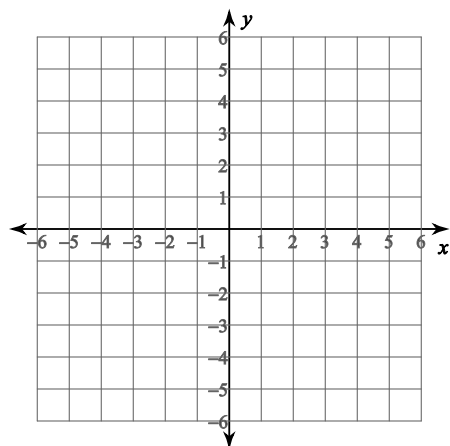
88) 
$$\frac{\frac{x^2}{2} + \frac{3x+5}{x^2}}{\frac{3x+5}{2}}$$

89) 
$$\frac{3}{\frac{5}{3} - \frac{1}{x}}$$

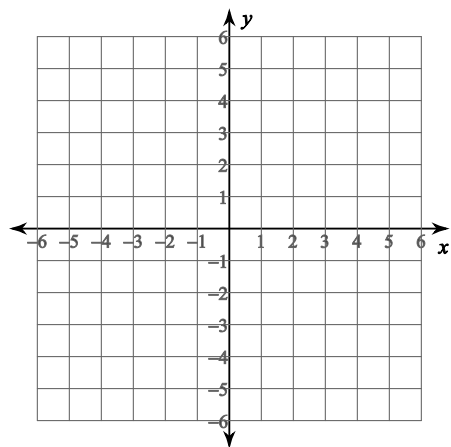
$$90) \frac{a^2}{\frac{a}{16} - \frac{a}{a-3}}$$

**Find the inverse of each function. Then graph the function and its inverse.**

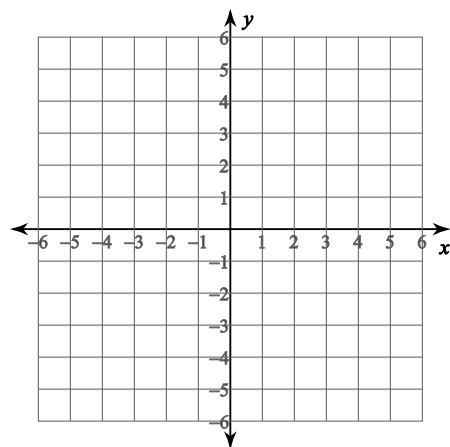
$$91) f(x) = 2x + 1$$



$$92) f(n) = -\frac{4}{5}n$$



$$93) g(x) = -5x$$



# Answers to Summer Review

1)  $-9x\sqrt[4]{8x^2}$   
 5)  $7 + 2\sqrt{10}$

2)  $-16x^3\sqrt[3]{2}$   
 6)  $\sqrt{3} - \sqrt{6}$

3)  $-20\sqrt[4]{5b}$   
 7)  $\frac{-6\sqrt{5} - 9\sqrt{3}}{7}$

4)  $-28\sqrt{15} + 42$   
 8)  $\frac{\sqrt{6} - \sqrt{3}}{2}$

9)  $\frac{1}{8p^3}$

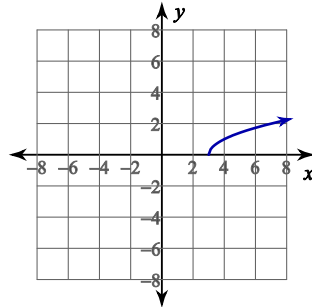
10)  $729x^9$

11)  $\frac{1}{8n}$

12)  $x^3y^{\frac{1}{8}}$

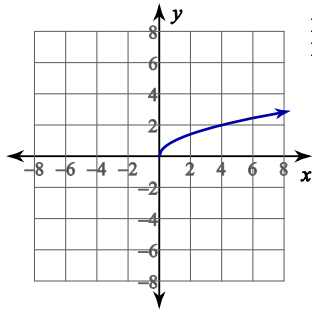
13)  $\frac{y^{\frac{1}{12}}x^{\frac{4}{3}}}{y}$

14)



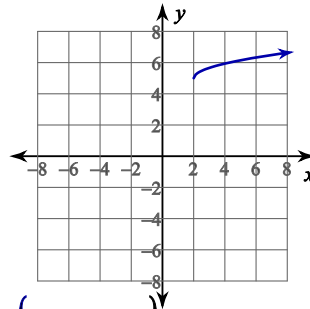
Domain:  $x \geq 3$   
 Range:  $y \geq 0$

15)



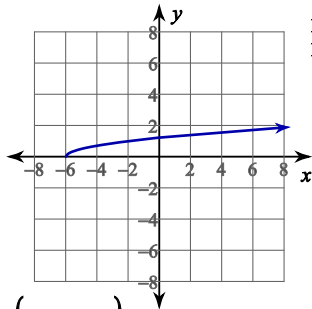
Domain:  $x \geq 0$   
 Range:  $y \geq 0$

16)



Domain:  $x \geq 2$   
 Range:  $y \geq 5$

17)



Domain:  $x \geq -6$   
 Range:  $y \geq 0$

18)  $\left\{\frac{25}{7}, -\frac{25}{7}\right\}$

19)  $\left\{-\frac{10}{3}, \frac{10}{3}\right\}$

20)  $\left\{-\frac{9}{7}, \frac{9}{7}\right\}$

21)  $-\frac{24}{5} \leq b \leq \frac{24}{5}$

22)  $-\frac{37}{6} \leq v \leq \frac{5}{3}$

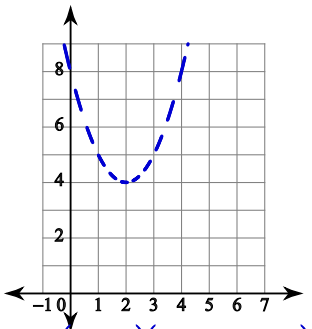
23)  $x \geq -\frac{1}{2}$  or  $x \leq -\frac{7}{2}$

24)  $\frac{1}{2} \leq n \leq \frac{5}{2}$

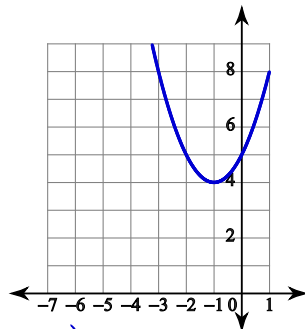
25)  $-\frac{21}{8} \leq a \leq \frac{611}{56}$

26)  $-\frac{5}{2} \leq k \leq \frac{31}{4}$

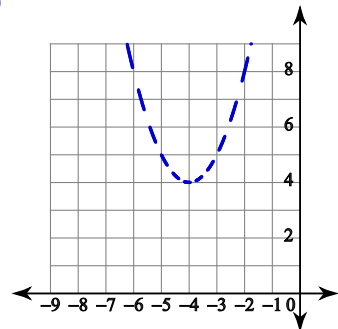
27)



28)



29)



30)  $y = (x+2)(x^2 - 2x + 4)(x-2)(x^2 + 2x + 4)$

31)  $y = 2x^2 - 4x + 11$

32)  $y = (x-5)(3x^2 + 5)$

33)  $y = (5x-4)(x-5)$

34)  $y = (x-5)(x^2 + 5x + 25)$

35)  $y = (x-4)(x^2 + 4x + 16)$

$$36) b^2 + 9b + 9 - \frac{6}{b+5}$$

$$39) x^3 - 2x^2 - 29x + 30$$

$$37) 2n^2 + 4n + 2 + \frac{9}{n-9}$$

$$40) 4x^3 - 9x^2 - 31x + 12$$

$$38) v^2 - v + 7 + \frac{2}{v-3}$$

$$41) \frac{k-4}{k-5}; \{-6, 5\}$$

$$42) \frac{(a+1) \cdot -1}{8a^2}; \{0, 8\}$$

$$43) \frac{2(p+3)}{7p+2}; \left\{-\frac{2}{7}\right\}$$

$$44) \frac{17n-13}{10(n+1)}$$

$$45) \frac{9x-6}{(x+2)(x-4)}$$

$$46) \frac{6r-2}{3r(r-1)}$$

$$47) \frac{9m-27}{(m-2)(m-5)}$$

$$48) \{2\sqrt{21}, -2\sqrt{21}\}$$

$$49) \{2\sqrt{21}, -2\sqrt{21}\}$$

$$50) \{4, 2\}$$

$$51) \{7\}$$

$$52) \left\{\frac{-1+\sqrt{17}}{4}, \frac{-1-\sqrt{17}}{4}\right\}$$

$$53) \{1\}$$

54) Falls to the left. Falls to the right

55) Rises to the left. Falls to the right

56) Rises to the left. Rises to the right

57) Rises to the left. Falls to the right

$$58) -14$$

$$59) 24$$

$$60) -14$$

$$61) \frac{29}{37}$$

$$62) 34$$

$$63) \frac{67}{7}$$

$$64) \left\{-\frac{1}{6}\right\}$$

$$65) \left\{\frac{7}{3}\right\}$$

$$66) \left\{-\frac{11}{3}\right\}$$

$$67) \left\{-\frac{1}{3}\right\}$$

$$68) \left\{-\frac{19}{2}\right\}$$

$$69) \left\{\frac{9}{2}\right\}$$

70) The dot next to the choice indicates that it is the answer.

$$71) \left\{\frac{3\pi}{2}\right\}$$

72) No solution.

$$73) \left\{\frac{3\pi}{2}\right\}$$

$$74) m\angle B = 57^\circ, a = 1.3 \text{ ft}, c = 2.4 \text{ ft}$$

$$75) m\angle A = 38^\circ, a = 16 \text{ m}, c = 26 \text{ m}$$

$$76) m\angle A = 66.4^\circ, m\angle B = 23.6^\circ, a = 13.7 \text{ in}$$

$$77) \frac{10\sqrt{19}}{19}$$

$$78) \frac{7}{8}$$

$$79) \{150, 330\}$$

$$80) \{120, 300\}$$

$$81) \{120, 300\}$$

$$82) \{45, 135\}$$

$$83) \frac{1}{2}$$

84) Undefined

$$85) \sqrt{2}$$

$$86) \frac{u^3 + 2u}{2u - 10}$$

$$87) \frac{6u}{13}$$

$$88) \frac{x^4 + 6x + 10}{3x^3 + 5x^2}$$

$$89) \frac{9x}{5x - 3}$$

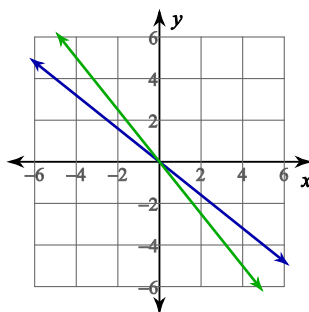
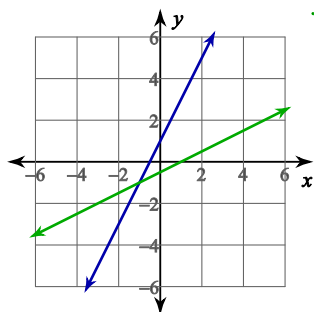
$$90) \frac{16a^2 - 48a}{a - 19}$$

$$91)$$

$$92)$$

$$f^{-1}(x) = \frac{x-1}{2}$$

$$f^{-1}(n) = -\frac{5}{4}n$$



93)

$$g^{-1}(x) = -\frac{x}{5}$$

